UNIVERSITY LECTURE SLIDES

Questionnaire Design: Step-by-Step Guide

A practical guide to designing valid, reliable, ethical, and student-friendly questionnaires for academic research.

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Lecture Overview

How this lecture is organized

From idea to instrument

Students will move from research purpose to tested questionnaire, then interpret the data produced by the instrument.

1. Why questionnaire design matters in research
2. Key terminology: constructs, items, scales, validity, reliability
3. Types of questionnaires and question formats
4. Eight-step design process from purpose to administration
5. Practical examples, ethics, classroom activity, and knowledge check

Learning Objectives

By the end of this lecture, students should be able to:

Define questionnaire design and explain its role in data collection.
Distinguish between major question types, scales, and administration modes.
Translate research constructs into clear questionnaire items.
Write unbiased questions with appropriate response options.
Plan pilot testing and basic data-quality checks.
Identify ethical issues such as consent, privacy, and sensitive questions.
Evaluate and improve a draft questionnaire using best-practice criteria.

Introduction

Why questionnaire design matters

A questionnaire is a structured research instrument used to collect comparable information from participants. Good design helps researchers measure what they intend to measure and reduces confusion, bias, missing data, and unusable responses.

In academic research, a questionnaire helps to:

1. Standardize questions across participants
2. Collect data efficiently from many respondents
3. Measure attitudes, perceptions, behaviors, or experiences
4. Prepare data for statistical or thematic analysis

Core idea

Questionnaire quality affects data quality. Weak wording can create weak evidence, even when the sample size and analysis are strong.

DESIGN BEFORE DATA

Key Definitions

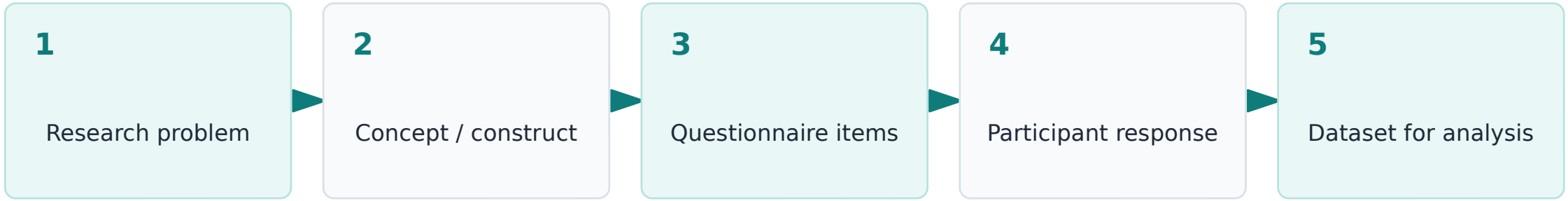
Essential terms for questionnaire design

Term	Student-friendly meaning
Questionnaire	A set of written or digital questions used to collect data from respondents.
Survey	The broader research method; it includes sampling, questionnaire design, administration, and analysis.
Item	One question or statement in a questionnaire.
Construct	An abstract concept being measured, such as satisfaction, anxiety, or digital literacy.
Response scale	The set of answer choices used to record responses.
Validity	The degree to which the questionnaire measures what it is intended to measure.
Reliability	The consistency of measurement across items, time, or respondents.

Background and Context

Questionnaires as measurement instruments

Questionnaires became central to social science and applied research because they allow researchers to ask standardized questions of many people and compare answers systematically.



Theoretical foundation

Concepts must be clearly defined before items are written.
Items should reflect the construct and the context of participants.
Measurement quality depends on validity, reliability, and clarity.

Response process

Respondents interpret the question.
They retrieve relevant memories or judgments.
They map their answer onto the provided scale.

Main Concepts in Questionnaire Design

The major decisions every researcher must make

Concept	Guiding question	Design implication
Construct alignment	What exactly is being measured?	Use items that match definitions and indicators.
Respondent fit	Can participants understand and answer?	Use simple language and relevant examples.
Question wording	Is the question clear and neutral?	Avoid leading, double-barreled, or vague wording.
Response options	Do answer choices cover likely responses?	Make options mutually exclusive and exhaustive.
Question flow	Does the order feel logical?	Begin with easy questions and group related items.
Testing	Have problems been identified early?	Use expert review, cognitive interviews, and pilot testing.

Types of Questionnaires by Structure

How fixed or flexible are the questions?

Structured questionnaire

All participants receive the same questions in the same order.
Mostly closed-ended items with predefined options.
Best for quantitative analysis and comparison.

Semi-structured / open questionnaire

Includes both fixed items and open questions.
Allows participants to explain reasons, experiences, or meanings.
Useful when researchers need depth as well as comparability.

TIP: Match structure to the research question

Types by Administration Mode

How the questionnaire reaches participants

Mode	Useful when…	Key concern
Online / web	Participants have internet access and quick data capture is needed.	Digital access, device compatibility, duplicate responses.
Paper-based	Participants are in classrooms, clinics, or field settings.	Manual entry, missing values, storage security.
Interviewer-administered	Participants need support or the topic requires probing.	Interviewer bias and consistency.
Mobile / app-based	Short surveys are needed in real time or on location.	Screen size and attention limits.

Mode affects wording, layout, question order, privacy, cost, response rate, and data quality. A questionnaire designed for paper may not work well on a small mobile screen.

Types of Questions

Common item formats used in questionnaires

Closed-ended questions

Participants choose from provided answers.
Easy to code, compare, and analyze statistically.
Requires careful design of response options.

Open-ended questions

Participants answer in their own words.
Useful for explanations, examples, and unexpected answers.
Requires coding or qualitative analysis.

Examples: multiple choice, checklist, ranking, rating scale, matrix items, demographic items, filter/skip questions, and open text boxes.

Response Scales and Measurement Levels

Choosing scales that match the analysis plan

Level / scale	Example question	Typical analysis
Nominal	Department: Education / Business / Health / IT	Frequencies, percentages, chi-square
Ordinal	Satisfaction: low / medium / high	Median, rank-based tests, cross-tabs
Interval / ratio	Age in years; weekly study hours	Mean, standard deviation, t-test, regression
Likert-type item	Strongly disagree to strongly agree	Item-level descriptive statistics; scale scores if justified
Semantic differential	Poor 1 2 3 4 5 Excellent	Profile comparisons and attitude measurement

Good practice: choose the response scale before collecting data, because scale choice affects coding, analysis, and interpretation.

Step-by-Step Roadmap

A practical workflow for building a questionnaire

1. Define purpose
2. Know participants
3. Operationalize constructs
4. Draft questions

1. Build scales
2. Organize flow
3. Pretest and revise
4. Administer and document

The process is iterative: pilot findings may send the researcher back to revise constructs, wording, response options, or layout.

Step 1: Define the Research Purpose

Begin with the study, not the questions

Ask first

What decision, explanation, comparison, or description will the questionnaire support?

Write the research problem in one clear paragraph.
State the research question or hypothesis before drafting items.
Identify which variables must be measured and which are optional.
Separate “interesting questions” from questions required for analysis.
Decide whether the questionnaire is descriptive, explanatory, evaluative, or diagnostic.

Step 2: Identify Population and Mode

Design for the people who will answer

Population decisions

Who is eligible to respond?
What language, reading level, and cultural context are appropriate?
Are any participants vulnerable or hard to reach?
What demographic items are needed for analysis?

Mode decisions

Will the questionnaire be online, paper-based, or interviewer-administered?
Can participants use the technology required?
How will confidentiality be protected?
Will skip logic or screening questions be needed?

Step 3: Operationalize Constructs

Move from abstract ideas to measurable indicators

Construct	Possible indicators	Example item
Student engagement	Attendance, participation, effort	I actively participate in class discussions.
Service quality	Responsiveness, reliability, empathy	Staff respond to my requests promptly.
Digital literacy	Search skills, security awareness, tool use	I can evaluate whether an online source is trustworthy.

Step 4: Draft Clear Questions

Write items that respondents can interpret consistently

Clear wording

Use simple, direct language.
Ask one idea per question.
Specify time periods when relevant.
Use terms participants are likely to understand.
Keep items as short as possible without losing meaning.

Avoid problematic wording

Leading questions that suggest a preferred answer.
Double-barreled questions with two issues at once.
Vague words such as “often,” “good,” or “regularly” without context.
Loaded or emotionally charged wording.
Assumptions that may not apply to every respondent.

Step 5: Build Response Options and Scales

Make answers easy to choose and easy to analyze

Principle	What it means	Example
Mutually exclusive	Only one option should fit.	Age: 18–24, 25–34, 35–44
Exhaustive	All realistic answers should be covered.	Add “Other” or “Not applicable” if needed.
Balanced	Positive and negative options are symmetrical.	Very dissatisfied to very satisfied
Labeled	Scale points are understandable.	Label endpoints and key points clearly.
Consistent	Use similar scale direction throughout.	Avoid switching from high-to-low to low-to-high.

Tip: Include “Prefer not to answer” for sensitive demographic or personal questions when appropriate.

Step 6: Sequence and Layout

Guide respondents through the questionnaire

Recommended flow

1. Brief introduction and consent information
2. Eligibility or screening questions if needed
3. Easy and engaging opening items
4. Core construct and outcome measures
5. Sensitive or demographic items near the end
6. Thank-you message and researcher contact

Layout principles

Use section headings to reduce confusion.
Keep instructions close to the questions they explain.
Avoid large matrix grids on mobile devices.
Use enough spacing for readability.
Show progress indicators only when they do not create pressure.

Step 7: Pretest, Pilot, and Revise

Find problems before the full study

1. Expert review
2. Cognitive interview
3. Small pilot
4. Revise instrument
5. Finalize version

What to check

Confusing wording or unfamiliar terms
Missing response options
Questions participants cannot answer accurately
High item nonresponse or skipped pages
Survey length and completion time

Evidence to collect

Participant comments and debriefing notes
Cognitive probing results
Completion rates and drop-off points
Item distributions and missing values
Reliability estimates for multi-item scales when relevant

Step 8: Administer and Manage Data Quality

Collect data with consistency and documentation

Data quality

Questionnaire design continues during administration: instructions, recruitment, reminders, and documentation affect the dataset.

Use a clear invitation message that explains purpose, time, consent, and confidentiality.
Keep the administration procedure consistent across participants.
Monitor completion rate, missing values, duplicate responses, and unusual response patterns.
Store data securely and separate identifiers from questionnaire data when possible.
Document questionnaire version, dates, mode, sampling method, and any revisions.

Practical Examples Across Disciplines

How questionnaire design changes by research context

Discipline	Example construct	Sample item focus
Social sciences	Civic participation	Voting, volunteering, community meetings
Business and management	Customer satisfaction	Service quality, loyalty, complaint handling
Education	Online learning readiness	Access, motivation, self-regulation, support
Health sciences	Patient experience	Communication, appointment access, care instructions
Psychology	Stress or self-efficacy	Feelings, coping, confidence in tasks
Information technology	Technology acceptance	Usefulness, ease of use, trust, security concerns

The same design principles apply, but examples, wording, and ethics must fit the discipline and participants.

Research Example: Applying the Design Process

Scenario: questionnaire for online learning readiness

Element	Example in the study
Research topic	Online learning readiness among undergraduate students
Research problem	Students may differ in access, motivation, and confidence with digital learning tools.
Research question	What factors are associated with undergraduate students’ readiness for online learning?
Population / participants	Undergraduate students enrolled at a university.
Data collection method	Online self-administered questionnaire with consent page and mobile-friendly layout.
Main questionnaire sections	Access to technology, self-regulation, digital confidence, perceived support, demographics.
Data analysis method	Descriptive statistics, reliability check for scale items, correlation or regression if assumptions are met.
Expected interpretation	Higher readiness may be linked with stronger digital confidence and institutional support.

Data Preparation and Analysis Planning

Design the questionnaire with analysis in mind

Before data collection

Assign variable names and coding rules.
Decide how missing values will be marked.
Plan reverse-coded items carefully, if used.
Identify which items form multi-item scales.
Check whether planned tests match measurement levels.

After data collection

Screen for incomplete responses and duplicates.
Check item distributions and unusual patterns.
Calculate scale scores only when justified.
Report sample characteristics and response patterns.
Interpret results in relation to item wording and limitations.

Comparison Table: Common Design Choices

Choosing the right approach for the study

Design choice	Strength	Limitation	Best use
Closed-ended items	Fast to answer and analyze	May miss unexpected views	Large surveys and statistical comparison
Open-ended items	Captures explanations and nuance	Requires coding and more time	Exploratory questions or follow-up explanations
Likert-type scales	Useful for attitudes and perceptions	Can be affected by response style	Agreement, satisfaction, confidence items
Ranking questions	Shows relative preference	Hard with many options	Priorities among a short list of options
Online mode	Efficient and easy to distribute	Access and attention concerns	Digitally connected populations
Paper mode	Works without internet	Manual entry and storage burden	Classroom, clinic, or field settings

Advantages of Well-Designed Questionnaires

Why researchers use questionnaires

Efficiently collect standardized data from many participants.
Support quantitative analysis, comparison, and generalization when sampling is appropriate.
Can measure attitudes, perceptions, behaviors, needs, and experiences.
Usually less costly than many interview or observation designs.
Allow anonymity or privacy for topics where respondents may not want face-to-face discussion.
Can be distributed across locations using digital tools.

Best value

Questionnaires are strongest when the research question requires comparable responses from many participants using carefully defined variables.

Limitations and Challenges

What questionnaire data cannot automatically solve

Measurement limitations

Respondents may misunderstand questions.
Self-reports may differ from actual behavior.
Social desirability may affect sensitive answers.
Poorly worded items can create measurement error.
Complex concepts may need multiple items or mixed methods.

Practical limitations

Low response rates can reduce representativeness.
Online surveys may exclude people without reliable access.
Long questionnaires can increase drop-off and careless responses.
Translation and cultural adaptation may be difficult.
Data quality depends on sampling and administration, not just wording.

Common Mistakes

Errors frequently made by beginning researchers

Writing questions before defining constructs and variables.
Including items that are interesting but unrelated to the research question.
Using double-barreled, leading, loaded, or vague wording.
Creating response options that overlap or leave out common answers.
Using too many matrix questions, especially in mobile surveys.
Forgetting instructions, consent information, or skip logic.
Skipping pilot testing and discovering problems after full data collection.
Treating every Likert-type item as automatically valid or reliable.

Best Practices Checklist

A quick quality-control guide

Before writing items

Define constructs and variables precisely.
Review existing instruments where appropriate.
Decide the analysis plan and measurement level.
Design for the target participants and mode.

Before data collection

Use clear instructions and neutral wording.
Keep scales consistent and response options complete.
Pilot test with people similar to the target participants.
Revise based on evidence, not personal preference.
Document the final version and administration process.

CHECKLIST THINKING PREVENTS DATA PROBLEMS

Ethical Considerations

Respecting participants throughout questionnaire research

Ethical issue	How to address it
Informed consent	Explain purpose, voluntary participation, risks, benefits, time required, and contact information.
Privacy and confidentiality	Collect only necessary data and store it securely. Avoid identifying details unless essential.
Sensitive questions	Use respectful wording, provide “prefer not to answer,” and place sensitive items carefully.
Participant burden	Keep the questionnaire as short as possible while still answering the research question.
Bias and fairness	Avoid discriminatory language and adapt instruments appropriately for culture and language.
Transparency	Report methods honestly, including sampling, recruitment, exclusions, and limitations.

Activity / Classroom Exercise

Improve a weak questionnaire item

Group task

Students work in pairs or small groups to diagnose and improve a poorly designed question.

Activity objective

Practice identifying wording problems and revising items to improve clarity, neutrality, and response quality.

Weak item for review

“Do you agree that the university should improve its excellent online learning system and provide more helpful teachers?”

1. Identify at least three design problems in the item.
2. Rewrite the item as one clear question.
3. Create a suitable response scale.
4. Share the revised version and explain why it is better.

Expected outcome: students produce a neutral, single-focus question with a clear scale.

Discussion Questions

Use these prompts for class conversation

1. Why is questionnaire design a measurement issue rather than only a writing task?
2. When might an open-ended question be better than a closed-ended question?
3. How can response options create bias or measurement error?
4. Why should sensitive demographic questions often appear near the end?
5. What problems may occur when a questionnaire is translated into another language?
6. How can pilot testing improve validity and reliability?
7. What ethical risks arise when collecting questionnaire data online?
8. How would you redesign a long questionnaire for mobile participants?

Knowledge Check

Answer individually, then compare in pairs

1. What is the difference between a questionnaire and a survey?
2. Which design problem occurs when one item asks about two issues at the same time?
3. Give one reason why pilot testing is important.
4. Which measurement level is used for categories such as gender, department, or nationality?
5. What does it mean for response options to be mutually exclusive?
6. Which is usually easier to analyze statistically: open-ended or closed-ended items?
7. Name one ethical consideration in questionnaire research.
8. Why should every item connect to a research question or variable?

Answer Key

Suggested answers for the knowledge check

#	Correct answer / expected idea
1	A questionnaire is the instrument; a survey is the broader method and process.
2	A double-barreled question.
3	It identifies confusion, missing options, timing issues, and data-quality problems before full collection.
4	Nominal level of measurement.
5	Only one option should correctly fit a respondent’s answer.
6	Closed-ended items.
7	Consent, privacy, confidentiality, sensitive wording, data security, or voluntary participation.
8	Unnecessary items increase burden and may collect data that cannot be justified or analyzed.

Key Takeaways and Conclusion

What students should remember

Questionnaire design turns research concepts into measurable items.
Good questionnaires align research questions, constructs, participants, mode, response scales, and analysis plans.
Clear wording and complete response options reduce bias and missing data.
Pilot testing, cognitive interviewing, and revision are essential quality-control steps.
Ethical questionnaire design protects privacy, reduces burden, and respects participant autonomy.

Conclusion

A questionnaire is only as strong as the design decisions behind it. When researchers design questions systematically, they collect evidence that is clearer, more ethical, and more useful for answering research problems.

References and Final Slide

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Thank You

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